CLAIMS

We claim:

1. A method of Fourier Transform spectrometry, comprising the steps of:

(a) providing a first fixed electromagnetic energy source and a second fixed electromagnetic energy source, said electromagnetic energy sources having a phase relationship, wherein said second fixed electromagnetic energy source is virtual;

(b) interfering electromagnetic energy output from said first and second fixed electromagnetic energy sources, thereby producing an interference pattern in the spatial domain;

(c) measuring the interference pattern; and

(d) transforming the interference pattern into a spectral content.

2. The method as recited in claim 1, wherein said virtual fixed electromagnetic energy source is provided by a reflective surface.

3. The method as recited in claim 2, wherein said reflective surface is planar or cylindrical.

4. The method as recited in claim 1, wherein said first fixed electromagnetic energy source and said virtual second fixed electromagnetic energy source are supplied by a light source optically demodulated by:

(a) receiving a light into an optical fiber;

(b) altering said light; and

(c) using said altered light as said first fixed electromagnetic energy source and said virtual second fixed light source.

5. The method as recited in claim 4, wherein altering said light is splitting said light.

6. The method as recited in claim 4, wherein altering said light is sending said light through a Bragg grating.

7. The method as recited in claim 1, further providing said first fixed electromagnetic energy source and said virtual second fixed electromagnetic energy source as a light source, transforming the interference pattern with an optoelectronic transducer, and optically measuring the interference pattern of a test material by placing the material between said light source and the optoelectronic transducer.

8. The method as recited in claim 1, wherein said interference pattern is altered prior to the measuring in step (c).

9. An apparatus of a non-scanning interferometer for spectral analysis, comprising:

(a) a fixed real radiant source and a fixed virtual radiant source separated by a known distance, said known distance fixed during a measurement, said fixed real radiant source and said fixed virtual radiant source having a phase relationship that produces an interference pattern;

(b) a non-scanning detector that spatially measures the interference pattern; and

(c) a non-scanning converter that converts the interference pattern into a spectral content.

10. The apparatus as recited in claim 9, wherein said non-scanning detector is linear or planar.

11. The apparatus as recited in claim 9, wherein said fixed virtual source is provided by a reflective surface.

12. The apparatus as recited in claim 11, wherein said reflective surface is planar or cylindrical.

13. The apparatus as recited in claim 9, wherein said fixed sources and said non-scanning detector define a space or volume there between selected from the group consisting of vacuum, gas, liquid, solid or a combination thereof.

14. The apparatus as recited in claim 9, wherein said fixed real radiant source and said fixed virtual radiant source receives light from an optical demodulation apparatus, comprising:

(a) an optical fiber for receiving and transmitting light;

(b) a light alteration unit that receives the light from the optical fiber and passes altered light into the pair of radiant light sources.

15. The apparatus as recited in claim 14, wherein the light alteration unit is a splitter.

16. The apparatus as recited in claim 14, wherein the light alteration unit is a Bragg grating.

17. The apparatus as recited in claim 13, wherein a disperser is placed between the pair of radiant sources and the non-scanning detector.